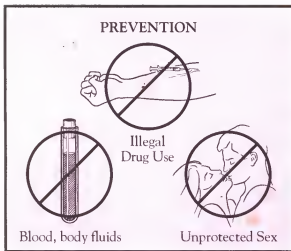


threatening liver damage. However, since these patients continue to carry the virus, they will almost always reinfect their new livers. Nevertheless, with continuing treatment for the chronic infection, liver transplantation offers these patients longer life and improved quality of life.

HEPATITIS C



Summary

Hepatitis C is a serious disease that often results in long-term complications. Many patients infected with HCV develop chronic hepatitis C. Some people become carriers of HCV without knowing it. For this reason it is important to prevent spread of the disease by lifestyle practices that avoid contact with infected blood and body fluids. Researchers are continually learning more about hepatitis C, and research into new treatments is ongoing. Chronic hepatitis C patients who are monitored frequently and follow the advice of their physicians have every reason to be hopeful about the future.

This material does not cover all information and is not intended as a substitute for professional medical care.

The Liver

The liver is the largest organ in the body. It is found high in the right upper abdomen, behind the ribs. It is a very complex organ and has many functions. They include:

- Storing energy in the form of sugar (glucose)
- Storing vitamins, iron, and other minerals
- Making proteins, including blood clotting factors, to keep the body healthy and help it grow
- Processing worn out red blood cells
- Making bile which is needed for food digestion
- Metabolizing or breaking down many medications and alcohol
- Killing germs that enter the body through the intestine

The liver shoulders a heavy work load for the body and almost never complains. It even has a remarkable power to regenerate itself. Still it should not be taken for granted. The liver is subject to illnesses, such as hepatitis C, which may lead to serious liver damage.

What is Hepatitis?

When cells in the body are injured by such things as chemicals or infection, the area that is

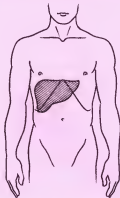
hurt becomes inflamed. Hepatitis is inflammation of the liver, which in turn causes damage to individual liver cells. It is most often caused by viral infection. There are different types of viral hepatitis. The most common are hepatitis A, hepatitis B, and hepatitis C. Other causes of hepatitis include alcohol, certain drugs, chemicals, diseases, hereditary disorders, and other infections.

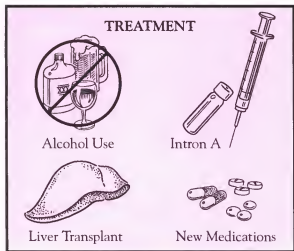
Hepatitis may be either acute or chronic. In acute hepatitis the inflammation develops quickly and lasts a fairly short period of time. The patient usually recovers completely, but it can take up to several months. Occasionally, a person fails to recover fully, and the hepatitis becomes chronic. In other words, it continues at a smoldering pace. Generally, anyone with hepatitis that continues longer than six months is considered to have chronic hepatitis. Chronic hepatitis can develop over a number of years without the patient ever having acute hepatitis or even feeling sick. As the liver repairs itself, fibrous tissue develops, much like a scar forms after a cut or injury to the skin. When scarring in the liver is extensive, it is called cirrhosis. Over time, cirrhosis irreversibly damages the liver, eventually ending in liver failure.

What is Hepatitis C?

Hepatitis C is caused by a virus (medically abbreviated as HCV). This type of viral hepatitis is different from the others in an important way. All patients with hepatitis A and most with hepatitis B develop an acute infection, recover completely, and develop antibodies that protect them from ever getting the disease again. However, the hepatitis C virus is a "quick-change" artist. Once inside the body, it changes its form to evade discovery and attack by the immune system. Scientists have already identified many forms of HCV, and patients infected with one type are not necessarily safe from other types. Hepatitis C patients do develop antibodies, but they are not curative or protective as in hepatitis A or B. Hepatitis C antibodies may not completely rid the body of the virus. Therefore, most people infected with the HCV virus will develop chronic hepatitis.

LOCATION OF LIVER





Current estimates are that 3.5 million Americans carry the virus that causes hepatitis C, and 150,000 people become infected with HCV each year. This virus is known to be spread through infected blood, blood products, and needles. Prior to the late 1980s, people were most at risk for contracting the disease through blood transfusions. However, a blood test was developed at that time to detect the virus, and the blood supply is now always tested to prevent spread of the disease in this way. Even so, there is a very slight risk for those who must receive blood products on a regular basis, such as hemophiliacs and patients on hemodialysis. Health care workers are also at risk. At this time, the people most at risk for getting hepatitis C are IV drug users who share needles. There are also a larger number of cases among east Asians. In about 40% of all cases of hepatitis C, it is unknown how the patient was infected with the virus. This situation is known as *community acquired disease*.

Symptoms and Diagnosis

Most patients with hepatitis C do not have symptoms. This is especially true early in the disease. If there are symptoms, they are usually mild and flu-like—perhaps nausea and fatigue. It can take from 2 to 26 weeks for the disease to develop once the patient is infected with HCV.

Routine blood tests will show an elevation in certain liver enzymes, especially one called the ALT. The physician can then order a specific blood test to determine if the patient has hepatitis C.

Chronic Hepatitis C

Hepatitis C is a cause for concern for two reasons. First, most cases become chronic. Second, patients seldom become acutely ill, so it is possible for them to have the disease for some time before it is diagnosed. Late in the disease, fatigue may become increasingly severe. If cirrhosis has developed, other more serious symptoms may occur. However, the elevation in the blood ALT may not correlate with the degree of liver inflammation. In other words, a high ALT may not necessarily mean there is a serious degree of inflammation. Conversely, a low or normal blood ALT level may be present even though there is chronic liver damage. For this reason, a liver biopsy is almost always required to determine how serious the disease may be. Under local anesthesia, a slender needle is inserted into the right lower chest. A small piece of liver tissue is taken out with the needle and examined under a microscope. A biopsy can show if cirrhosis is present and how far it has progressed. It is believed that about 20% of the patients with chronic hepatitis C will develop cirrhosis, and a few of those will go on to develop liver cancer. It may take from 10 to 40 years for serious liver damage to occur.

Treatment

Both the patient and physician have a role in treating hepatitis C. It is now known that alcohol use, even in socially accepted amounts, makes the liver disease worse. So while the virus is present in the body, it is best to avoid alcohol altogether. Patients should also discuss the use of over-the-counter medicines with the physician. Some drugs such as acetaminophen (Tylenol) that may not be normally toxic can worsen liver damage in HCV. Of course, a healthy diet is always important. The patient will also want to discuss vaccination against

hepatitis viruses A and B. If a person with HCV becomes infected with either of these other viruses, the outcome could be quite severe. The patient should be careful to avoid the possibility of getting these other diseases. This means no IV drugs or unprotected sex with a new partner with unknown sexual activity history.

Now to medicines. As of 1999, there are two programs available to treat HCV. One is the use of interferon (IFN) by itself. IFN is a synthetic form of a substance the body naturally produces to fight infections and strengthen the immune system. There are some bothersome side effects with the drug, such as fatigue and flu-like symptoms following each injection. Usually, interferon is injected three times a week for at least six months and often for a year. The second treatment is to combine IFN with an oral medicine called ribavirin. This is particularly helpful in treating those patients who have not responded to IFN alone. A side effect of ribavirin is a mild anemia or low red cell count in the blood.

HCV Carriers

Certain people infected with HCV have a positive HCV blood test, but a normal liver enzyme test. These individuals are often called HCV carriers, and they can pass the virus on to others.

Although they appear not to be seriously ill, there is recent evidence that even these people may have chronic hepatitis. Therefore, each should be evaluated by a liver specialist.

Sex and Pregnancy

The risk of transmitting HCV sexually is low compared to hepatitis B and AIDS. In marriages and long-term relationships with monogamous partners, it is often the case that one person is HCV positive and the partner is HCV negative. The current medical recommendation is that in these circumstances, sexual practices need not be changed. However, when people have multiple sex partners or new partners, they should never engage in unprotected sex.

It appears that in pregnancy, HCV is passed on to the fetus less than 5% of the time. It may depend on how high the mother's blood virus level is during pregnancy. Therefore, hepatitis C infected women should always consult with their physicians before becoming pregnant.

Prevention

There is no vaccine currently available to protect against hepatitis C, as there is with hepatitis A and hepatitis B. People can prevent getting hepatitis C by not sharing anything that is likely to hold and transmit blood—razors, manicure tools, toothbrushes, and especially IV drug needles. Practices such as ear piercing and tattooing should be avoided in places where sterile conditions are questionable. Until all circumstances under which HCV can be transmitted have been thoroughly identified, it should be assumed that every person with hepatitis C can pass the virus on to others. Therefore everyone, especially health care workers, should avoid coming in contact with blood and body fluids from infected individuals.

Liver Transplantation

Liver transplantation is a successful form of therapy for people with a badly damaged liver. Liver transplants have become more common for people with chronic hepatitis C who develop life-

